

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

FEDERALLY ENFORCEABLE CONDITIONAL MAJOR DRAFT PERMIT No. F-05-011

MARKWEST ENERGY APPALACHIA, LLC.

SOUTH SHORE, KY

AUGUST 31, 2006

SOURCE I.D. #: 021-089-00005

SOURCE A.I. #: 1600

ACTIVITY I.D. #: APE20040001

SOURCE DESCRIPTION:

MarkWest Energy Appalachia, LLC owns and operates an onshore natural gas processing plant located in South Shore, Kentucky referred to as the Siloam facility. This facility receives natural gas liquids from pipeline and from trucks and then physically separates the natural gas liquids into its pure components, such as propane, butane and other products.

The Siloam facility is classified as an onshore natural gas processing plant that uses fractionation to produce a variety of products from natural gas liquids (NGL). The equipment at this facility, which also has the potential to generate emissions of regulated air contaminants, is capable of producing propane, normal butane, isobutane, high-purity butanes and natural gasoline. Operations at the facility include NGL fractionation equipment, above/under ground storage and process tanks, truck loading/unloading operations, railcar loading operations and river barge loading operations. The facility is also equipped with two small industrial boilers (each less than 250 mmBtu/hr).

This source has been operating pursuant to the requirements of current permits S-98-001, issued January 16, 1998, and S-99-023, issued May 19, 1999. The permittee submitted a request for renewal approval as a Conditional Major on March 10, 2004. This permit is the renewed issuance of the source's plant-wide permit as a Conditional Major operating permit.

COMMENTS:

Since the issuance of current permits S-98-001 and S-99-023, certain equipment at the facility has been taken out of service or was never constructed after approval, negating related requirements for such equipment as initially reflected in S-98-001. The following table summarizes the status of the emission points at this source reflected in this renewal permit.

Emission Points Listed Under Permits S-98-001 & S-99-023*		Emission Points - Current Status		Explanation of Change
EP #	Emission Point Description	EP #	Emission Point Description	
01	Henry Vogt VV-27 Boiler # 1	01	Henry Vogt VV-27 Boiler # 1	No change
02	Henry Vogt VV-27 Boiler # 2	02	Henry Vogt VV-27 Boiler # 2	No change

Emission Points Listed Under Permits S-98-001 & S-99-023*		Emission Points - Current Status		Explanation of Change
EP #	Emission Point Description	EP #	Emission Point Description	
04	Fractionation Towers Dehydration Unit, Isomerization Unit and Storage Tanks (valves, flanges, pumps and compressors)	04	Fugitive Emissions - Natural Gas Liquids Fractionation (Valves, Pumps, Compressors, Pressure Safety Devices & Connectors)	Change to description. NGL Fractionation towers and related equipment. Storage tank valves, pumps, etc., are included here. (Description change requested in May 8, 2000 letter to KDAQ).
05	Flare; Barge Loading, Tank Car Loading, Tank Truck Loading and Five JP-4 Blend Tanks (45,000 gals. each)	05	Flare	The only points venting to the flare are tank car loading, tank truck loading, SV-502 (formally identified as 5 JP-4 blend tanks) and YD-29 vessels, thus the description has been changed. These four emission sources are now listed as separate points that vent to the flare, as reflected below in this table.
06	Reactor Feed Heater	06	Barge Loading	The Reactor Feed Heater is permanently out of service and is removed from the permit. Emission point #06 has been changed to barge loading (as requested in letter to KDAQ dated May 8, 2000).
07	Isomerization Unit (Carbon Tetrachloride adsorber vent)	07	Railcar Loading	The Carbon Tetrachloride Adsorber is permanently out of service and is removed from the permit. Emission point #7 has been changed to Railcar Loading (as requested in letter to KDAQ dated May 8, 2000).
08	Iso-butane Tank - 210,000 gallons(SV-406)	08	Tank Truck Loading	SV-406 is now listed as an insignificant source. Emission point #08 has been changed to Tank Truck Loading (as requested in letter to KDAQ dated May 8, 2000).
09	Isopentane Tank - 210,000 gallons (SV-407)	09	Vessel SV-502	SV-407 is now listed as an insignificant source. Emission point #09 has been changed to Vessel SV-502 (as requested in letter to KDAQ dated May 8, 2000).
10	N-Pentane Tank - 45,000 gallons (SV-600)	10	Vessel YD-29	SV-600 is now listed as an insignificant source. Emission point #10 has been changed to Vessel YD-29 (as requested in letter to KDAQ dated May 8, 2000).
11	N-Pentane Tank - 45,000 gallons (SV-601)	NA	NA	SV-601 is now listed as an insignificant source. There is no longer an emission point #11.
12	Natural gasoline tank - 630,000 gallons	NA	NA	This tank was never constructed. There is no emission point #12.
13	65.69 mmBtu/hr STAR Package Boiler	NA	NA	This unit was never constructed. There is no emission point #13.
14	40.6 mmBtu/hr STAR Reactor Furnace Effluent Condenser, Air Heat Exchanger, Tow-Stage Product Compressor	NA	NA	This unit was never constructed. There is no emission point #14.

Emission Points Listed Under Permits S-98-001 & S-99-023*		Emission Points - Current Status		Explanation of Change
EP #	Emission Point Description	EP #	Emission Point Description	
15	840,000 gallon MTBE Storage Tank with Internal Floating Roof	NA	NA	This unit was never constructed. There is no emission point #15.
16	243,000 gallon MTBE Storage Tank with Internal Floating Roof	NA	NA	This unit was never constructed. There is no emission point #16.
17	Air Flare with Natural Gas Pilot	NA	NA	This unit was never constructed. There is no emission point #17.
17	MTBE Tank Car, Barge and truck Loading and Methanol Unloading, 13 VOC Service Pressure Relief Valves	NA	NA	This unit was never constructed. There is no emission point #17.
17	840,000 gallon Methanol Storage Tank with a Fixed Roof	NA	NA	This tank is being used for natural gasoline storage and should be listed as emission point #10 (listed above). There is no emission point #17.
18	Pipeline Equipment associated with the entire MTBE Process Unit	NA	NA	This unit was never constructed. There is no emission point #18.

* All emission points are approved in Permit No. S-98-001, except Emission Point 2 which is the only emission point approved in Permit No. S-99-023.

Table 2: Insignificant Activities

<u>Description</u>	<u>Generally Applicable Regulation</u>
1. Storage of liquefied petroleum gas in fixed roof pressurized tanks designed to operate in excess of 204.9 kPa (29.72 psi) with no emissions to the ambient air:	None
SV-100 (60,000 gallons), installed 1991	
SV-101 (18,000 gallons), installed 1974	
SV-102 (18,000 gallons), installed 1974	
SV-103 (30,000 gallons), installed 1988	
SV-104 (30,000 gallons), installed 1988	
SV-200 (57,707 gallons), installed 1958	
SV-201 (57,744 gallons), installed 1958	
SV-202 (57,671 gallons), installed 1958	
SV-203 (57,754 gallons), installed 1958	
SV-204 (59,582 gallons), installed 1982	
SV-205 (59,672 gallons), installed 1982	
SV-300 (32,133 gallons), installed 1958	
SV-301 (32,122 gallons), installed 1958	
SV-400 (15,115 gallons), installed 1960	
SV-402 (30,000 gallons), installed 1960	
SV-403 (42,151 gallons), installed 1991	
SV-404 (42,151 gallons), installed 1991	
SV-405 (42,151 gallons), installed 1991	
SV-406 (210,000 gallons), installed 1991	
SV-407 (210,000 gallons), installed 1991	

- SV-500 (30,618 gallons), installed 1958
SV-501 (259,723 gallons), installed 1958
SV-600 (42,151 gallons), installed 1991
SV-601 (42,151 gallons), installed 1991
2. (5) 1000 gallon Ethyl Mercaptan Tanks None
(1) 500 gallon Ethyl Mercaptan Tank None
(2) 350 gallon Diesel Fuel Tanks None
(1) 1000 gallon Used Oil Tank None
(1) 125 gallon Diesel Tank None
(1) 30 gallon solvent parts cleaner None
3. Cooling Tower None

Emission factors

Boilers: from AP-42, Tables 1.4-1 and 1.4-2, 7/98 (< 100 mmBtu/hr Heat Input).
Fugitive Emissions: USEPA Protocol for Equipment Leak Estimates, EPA 453/R-95-017, November 1995, Table 2-8) and weight fraction.
Flare: from AP-42, Tables 1.4-1 and 1.4-2, 7/98 (< 100 mmBtu/hr Heat Input).
Barge, Railcar and Tank Truck Loading: from AP-42 and Engineering Estimates.
Vessels SV – 502 (vessel SV-502 is inclusive of throughput from vessels SV 502, 503, 504, 505 and 506) and YD – 29: from AP-42 and TANKS 4.09.

Applicable Regulations

- 401 KAR 52:030 - *Federally enforceable permits for nonmajor sources*. This applies to sources that accept permit conditions that are legally and practically enforceable to limit their potential to emit (PTE) below the major source thresholds that would make them subject to 401 KAR 52:020.
- 401 KAR 60:005 incorporating by reference 40 CFR 60, Subpart KKK, *Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants*. The requirements of this rule apply to EP04, Fugitive Emissions, since modifications have been made since January 20, 1984 to affected equipment, i.e., compressors in VOC service or in wet gas service and process units, as defined. The permittee shall continue to comply with the applicable requirements of 40 CFR 60, Subpart VV, *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry, as specifically identified in 40 CFR 60, Subpart KKK*.
- 401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984*. The rule is applicable to storage tanks SV-502, SV-503, SV-504, SV-505, SV-506 and YD-29, as each vessel was constructed or modified after July 23, 1984. Vessels SV-503, SV-504, SV-505 and SV-506 vent to and are vapor balanced with SV-502. Vessel SV-502 is controlled by a vapor recovery system that is connected to a flare. Vessel YD-29 is also connected to, and controlled by, the flare.
- 401 KAR 61:015 – *Existing indirect heat exchangers*, which applies to emission units with a capacity of 250 mmBtu/hr heat input or less constructed before April 1972. This rule applies to both Boiler Nos. 1 and 2, as each unit was constructed in 1958 and 1960, respectively, (prior to April 1972).

401 KAR 63:015, *Flares*. This rule is applicable to the existing flare that is connected to the vapor recovery system for emissions control pursuant to 40 CFR 60, Subpart Kb.

40 CFR 60.18, *General Control Device Requirements*. These requirements apply to the flare as specified in 40 CFR 60 Subpart Kb.

EP#01 and #02 PM Limitation:

Pursuant to 401 KAR 61:005 Appendix A the standard for particulate matter is calculated by the following equation:

$$\text{Boiler\#1 (Installed in 1958), and Boiler \#2 (Installed 1960)*} \\ 0.9634 (\text{total heat input capacity})^{-0.2356} = 0.9634(87.2)^{-0.2356} = 0.3362 \text{ lb / mmBtu}$$

(Greenup County belongs to the Huntington-Ashland Air Quality Region – the Region Classification with Respect to Particulate Matter is Priority I [401 KAR 50:020 and 401 KAR 61:015])

* The allowable emission rate is determined in accordance with 401 KAR 61:015, Section 3(1) based on the **total** rated heat input capacity of the two existing boilers, (i.e., $43.6 \times 2 = 87.2$ mmBtu/hr).

EP#01 and #02 SO₂ Limitation:

Pursuant to 401 KAR 61:015 Appendix B the standard for sulfur dioxide is calculated by the following equation:

$$\text{Boiler\#1 (Installed in 1958), and Boiler\#2 (Installed in 1960)} \\ 8.0189 (\text{total heat input capacity})^{-0.1260} = 8.0189 (87.2)^{-0.1260} = 4.5668 \text{ lb / mmBtu}$$

(Greenup County belongs to the Huntington-Ashland Air Quality Region – the Region Classification with Respect to Sulfur Dioxide is Class V [401 KAR 50:020 and 401 KAR 61:015])

Non-Applicable Regulations

40 KAR 59:050. *New storage vessels for petroleum liquids*. This rule does not apply because the facility is not in a nonattainment county.

40 KAR 61:050. *Existing storage vessels for petroleum liquids*. This rule does not apply because the facility is not in a nonattainment county.

401 KAR 61:095. *Existing solvent metal cleaning equipment*. The provisions of this subpart do not apply to the 30-gallon solvent parts cleaner, as an insignificant activity, since this unit was installed in 1993, which is after the classification date of June 29, 1979.

401 KAR 59:185, *New solvent metal cleaning equipment*. The provisions of this subpart do not apply to the 30-gallon solvent parts cleaner, as an insignificant activity, since the facility is not located in a county or portion of a county designated as nonattainment for ozone.

40 CFR 60 Subpart LLL, *Standard of Performance for Onshore Natural Gas Processing: SO₂ emissions*. This regulation does not apply since MarkWest Energy Appalachia, LLC does not operate natural gas sweetening units.

40 CFR 63 Subpart Q, *National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers*. The provisions of this subpart do not apply to the cooling towers, as an insignificant activity, since this unit does not use chromium-based water treatment chemicals, nor is this a major source of HAP emissions, as defined at 40 CFR 63.2.

- 40 CFR 63 Subpart T, *National Emission Standards for Halogenated Solvent Cleaning*. The provisions of this subpart do not apply to the 30-gallon solvent parts cleaner, as an insignificant activity, since this unit does not use regulated halogenated HAP solvents in a total concentration greater than 5 percent by weight as a cleaning or drying agent.
- 40 CFR 64, Compliance Assurance Monitoring (CAM), does not apply to any emission unit because this source is being approved to operate under a Conditional Major permit and, pursuant to 40 CFR 64.2(a), the requirements of this rule are applicable only to a source required to obtain a Title V (Part 70 or 71) permit.
- 40 CFR 60, Subpart K, *Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978*, does not apply to any of the tanks in Section C of the permit since none of the tanks with a capacity greater than 40,000 was installed between June 11, 1973 and May 19, 1978.
- 40 CFR 60, Subpart Ka, *Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984*, does not apply to any of the tanks in Section C of the permit since all tanks with a capacity greater than 40,000 gallons that were installed between June 11, 1973 and May 19, 1978 are designed to operate in excess of 204.9 kPa (15 psi) with no emissions to the ambient air. Such tanks are not *storage vessels* pursuant to 40 CFR 60.111a(a)(1).
- 40 CFR 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984* does not apply to any of the tanks in Section C of the permit since these tanks are pressurized and operate in excess of 204.9 kPa without emissions to the atmosphere.

EMISSIONS AND OPERATING CAPS DESCRIPTION:

VOC and HAP Conditional Major Limitation:

MarkWest Energy Appalachia, LLC has requested voluntary permit emission limits of 9 tons per year (tpy) or less of a single hazardous air pollutant (HAP), 22.5 tpy or less of combined HAPs, and 90 tpy or less of volatile organic compounds (VOC). Compliance with these permit limits shall make the requirements of 401 KAR 52:020, Title V permits, not applicable to this source. Compliance with the VOC limit shall also make this source a synthetic minor source pursuant to 401 KAR 51:017, Prevention of significant deterioration of air quality.

PERIODIC MONITORING:

EP#01 and #02 – Boilers #1 and 2:

The permittee shall monitor and maintain records of the following information:

- a. The monthly natural gas/propane usage rate (cubic feet or gallons per month).
- b. The monthly hours of operation of each boiler.
- c. The sulfur content of natural gas/propane burned. The sulfur content may be determined by fuel sampling and analysis or by fuel supplier certification.
- d. During periods of boiler startup, shutdown or malfunction, log of the following information shall be kept:
 - 1) Whether any air emissions were visible from the boiler stack.
 - 2) Whether the visible emissions were normal for the process.
 - 3) The color of the emissions and whether the emissions were light or heavy.
 - 4) The cause of the abnormal visible emissions
 - 5) Any corrective actions taken.

EP#04 – Fugitive Emissions:

Monitoring shall be done in accordance with procedures given in 40 CFR 60 Subpart KKK, Section 60.632, *Standards*, and 40 CFR 60 Subpart VV, Section 60.482-1 through 10, *Standards*, and/or Section 60.483-1 and 2, *Alternative Standards*.

EP#05 – Flare:

Monitoring shall be done in accordance with 40 CFR 60.18, *General Control Device Requirements*. These requirements are incorporated into the permit **Section B** for EP 05 (Flare).

EP#09, and #10 – Vessels SV-502 and YD-29:

- a. The permittee shall maintain records of the VOL stored, the period of storage, and the maximum true vapor pressure of that VOL during the respective storage period.
- b. The permittee shall notify the Administrator within 30 days when the maximum true vapor pressure of the liquid exceeds the respective maximum true vapor pressure values for each volume range.
- c. Pursuant to 40 CFR 60.116b (b), for each tank listed above, the permittee shall keep readily accessible records showing the dimensions of the tank and an analysis showing the capacity of the tank. The records shall be kept for the life of the tank.

OPERATIONAL FLEXIBILITY:

None

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.